1 February 2000
NRL 5524

PURCHASE DESCRIPTION

REFLECTOMETER, FREQUENCY DOMAIN

SCAT 4473

1.0 **GENERAL** This procurement requires a swept-frequency reflectometer capable of characterizing faults in antennas, and coaxial and waveguide transmission lines.

2.0 **CLASSIFICATION** The equipment shall meet the requirements of MIL-PRF-28800F, Class 3 for Navy shipboard, submarine and shore applications with the following modifications and exceptions:

a. The operating and non-operating altitude requirements are not invoked.

3.0 **OPERATIONAL REQUIREMENTS** The equipment shall be capable of characterizing Transmission lines with a single measurement as specified below. The unit shall be capable of displaying distance-to-fault with associated line loss and VSWR vs. frequency. The unit shall be capable of generating hard-copy printouts (when attached to a printer) and storing the information such that it can be transferred to a computer (using the Microsoft Windows95 or later operating system) for display and printing. Computer software required to display and print the data will be provided with the equipment.

3.1 Frequency Range. 2 MHz to 1.25 GHz

3.2 Impedance. 50 ohms nominal

3.3 VSWR accuracy
a. 5% maximum for indicated values of 1.10 to 1.99.
b. 10% maximum for indicated values of 2.00 or higher.

3.4 Sweep Rate. At least 1 point/30 ms

3.5 Sweep Increments. 10 kHz minimum frequency step size

3.6 Foreign Signal Rejection. A means shall be provided wherein harmonics and foreign signals that are within 10% of the operating frequency, and have an amplitude of 10 dBm or less for distance-to-fault measurements and 0 dBm or less for VSWR vs. frequency measurements, are rejected from the characterization process.

3.7 Distance-to-fault and Line Loss Mode. The equipment shall measure and indicate the distance to each fault in a transmission line, the line loss, and VSWR associated with each fault.

3.7.1 Dynamic range: • 50 dB [RF out =< 7 dBm typical]

3.7.2 Location accuracy (D = distance to fault)
a. • ±1.5 ft [D • 150 ft]
b. • ± D/100 [D • 150 ft]

3.7.3 Overload indication. When the input exceeds 17 dBm, the equipment shall provide the operator with an overload indication. Maximum input: 22 dBm

3.8 VSWR vs. Frequency Mode. A mode shall be provided where the equipment will measure and indicate VSWR vs. frequency.

3.8.1 Dynamic range: • 50 dB

4.0 GENERAL REQUIREMENTS

4.1 Power Source: MIL-PRF-28800F nominal power source requirements are invoked. Maximum power consumption: 25W

4.2 Battery restrictions: Per MIL-PRF-28800F, lithium and mercury batteries are prohibited without prior authorization. A request for approval for the use of lithium or mercury batteries, including those encapsulated in integrated circuits, shall be submitted to the procuring activity at the time of submission of proposals. Approval shall apply only to the specific model proposed.

4.3 Weight: The total weight of the unit less accessories shall not exceed 4.5 kg (10 lbs.).

4.4 Dimensions: The total volume of the unit shall not exceed 6293 cm^3 (384 in^3).

4.5 Calibration Interval: The calibration interval shall be 24 months minimum. The equipment shall be within all accuracy requirements specified herein, with a 72% or greater confidence factor following a calibration interval of 12 months.

4.6 Remote Operation: The unit will be capable of remote operation through a RS232 or IEEE488 interface. At a minimum, it shall operate as a listener such that all functions except the power on/off switch are controllable.

4.7 Technical manual: A technical manual shall be provided in both printed and electronic formats. The printed format shall be otherwise normally provided. The electronic format shall consist of the installation programs for the latest version of Adobe Acrobat for all computer platforms for which Acrobat is available and the technical manual in an electronic form that is readable through use of the Adobe Acrobat application.

4.8 Year 2000 Compliance: The manufacturer shall certify that the equipment is not susceptible to malfunction as a result of date/time functions associated with the calendar year 2000 or later.

4.9 Hard transit case: The equipment shall be supplied with a hard transit case. The hard transit case shall have provisions for stowage of the equipment, any accessories, and at least the operator's manual. The transit case shall comply with the requirements of the MIL-PRF-28800F performance specification.

4.10 Interactive Training: A CD-ROM that provides interactive training capabilities to demonstrate the features and basic operation of the signal generator shall be provided.

4.11 Software: Computer software required to display and print data obtained from the frequency domain reflectometer will be included. The software shall operate on computers with the Microsoft

Windows95 (or later) operating system. It shall permit the computer to display data obtained from a frequency domain reflectometer and replicate the analysis capabilities.

4.12 Accessories:

4.12.1 Shielded open {Type N(m)}
4.12.2 Short {Type N(m)}
4.12.3 50 Ohm Termination {Type N(m)}
4.12.3.1 VSWR: Less than 1.1:1 up to 2 GHz
4.12.4 Adapter Kit. All adapters shall be plated or anodized in a distinct color to clearly identify adapters as part of this kit. Plating/Anodization can be limited to entire outer surface - outer surface defined as the surface area visible when adapter is fully mated to connectors - but if not limited to outer surface, shall not impact electrical properties of adapter.
4.12.4.1 N[m] - N[m]
4.12.4.2 N[m] - N[f] / 90°
4.12.4.4 N[m] - UHF[m]
4.12.4.3 N[m] - UHF[f]
4.12.4.5 N[f] - {1-5/8 EIA Flange (unisex)}
4.12.4.6 N[m] - {7-16 DIN[m]}
4.12.4.7 N[m] - {7-16 DIN[f]}
4.12.4.8 N[m] - C [m]
4.12.4.9 N[m] - C[f]
4.12.4.10 N[m] - HN[m]
4.12.4.11 N[m] - HN[f]
4.12.4.12 N[m] - TNC[m]
4.12.4.13 N[m] - TNC[f]
4.12.4.14 N[m] - BNC[m]
4.12.4.15 N[m] - BNC[f]
4.12.4.16 N[m (or f)] - LC[m]
4.12.4.17 N[m (or f)] – LC[f]
4.12.4.18 BNC[f] - PJ
4.12.4.19 BNC[f] - PJ-S
4.12.4.20 Adapter Kit Case designed to house all adapters less N[f] – {1-5/8 EIA} and to fit within the confines of the hard transit case.